
Name of Organization: USGS

Type of Organization: Federal Agency

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Project Title: Ground-Water Model for Little Calumet River Basin

Project Category: Pollution Prevention and Reduction - BNS

Rank by Organization (if applicable): 1

Total Funding Requested (\$): 220,000 **Project Duration:** 2 Years

Abstract:

A modular, three-dimensional, finite-difference ground-water-flow model (MODFLOW) will be constructed for the Little Calumet River Basin in northwestern Indiana. The project will expand the model for the adjacent Grand Calumet Aquifer that was completed by the U.S. Geological Survey. The initial model was used to estimate ground-water discharges and contaminant loadings for Total Maximum Daily Loads in the Grand Calumet River, and to relate directions and rates of ground-water flow to known contaminant sources. The expanded model will have the same use for the Little Calumet River Basin. The model will use a geographic information system to compile hydrologic and geologic data and as a pre-processor of model input values. A data collection network of new monitoring wells and data recorders will be combined with the existing streamflow gages to calibrate and evaluate the model. The hydrologic model will be used to quantify ground-water discharge within specific stream reaches. Nonpoint-source contaminant loading will be estimated using water-quality data and information from the model. A broad public dissemination of the results is intended, in published and Internet format. The project will be coordinated with the Federal, State, and local-regional programs working on water resources in northwestern Indiana.

Geographic Areas Affected by the Project

States:

- | | |
|---------------------------------------------|---------------------------------------|
| <input type="checkbox"/> Illinois | <input type="checkbox"/> New York |
| <input checked="" type="checkbox"/> Indiana | <input type="checkbox"/> Pennsylvania |
| <input type="checkbox"/> Michigan | <input type="checkbox"/> Wisconsin |
| <input type="checkbox"/> Minnesota | <input type="checkbox"/> Ohio |

Lakes:

- | | |
|----------------------------------------------|------------------------------------|
| <input type="checkbox"/> Superior | <input type="checkbox"/> Erie |
| <input type="checkbox"/> Huron | <input type="checkbox"/> Ontario |
| <input checked="" type="checkbox"/> Michigan | <input type="checkbox"/> All Lakes |

Geographic Initiatives:

- | | | | | |
|------------------------------------------|----------------------------------|------------------------------------------------|--------------------------------------|-----------------------------------------|
| <input type="checkbox"/> Greater Chicago | <input type="checkbox"/> NE Ohio | <input checked="" type="checkbox"/> NW Indiana | <input type="checkbox"/> SE Michigan | <input type="checkbox"/> Lake St. Clair |
|------------------------------------------|----------------------------------|------------------------------------------------|--------------------------------------|-----------------------------------------|

Primary Affected Area of Concern: Not Applicable

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area: Not Applicable

Other Affected Biodiversity Investment Areas:

Problem Statement:

The Little Calumet River in northwestern Indiana is a source of toxics loading and microbiological contaminants to Lake Michigan. The Indiana Department of Environmental Management has scheduled development of Total Maximum Daily Loads (TMDLs) for four reaches of the Little Calumet River in Indiana, starting in 2000. Nonpoint-source contaminant loading to the river caused by ground water discharge must be quantified as part of the TMDLs. Ground-water discharge and contaminant loadings could be estimated if a hydrologic model of the Little Calumet River Basin were available. A combination of existing and new data would be used as input to the model, and to calibrate and evaluate the model. In addition to TMDL development, knowledge of ground-water-contaminant loading is needed for purposes of remedial action, nonpoint-source management, wetland and ecosystem protection, and brownfields redevelopment.

Proposed Work Outcome:

The following products will be derived from this project: a computerized ground-water model, a monitoring-well network, geographic-information-system data sets, new hydrologic, geologic, and water-quality data, a quality-assurance plan for the water-quality data, a widely available report about ground-water flow, ground-water quality, and ground-water/surface-water interaction in the Little Calumet River Basin, project coordination meetings with Federal, State, and local-regional stakeholders, and public information on the Internet.

Dissemination and use of the technical information and interpretations from this project will provide the following benefits: (a) reduced toxics loading to Lake Michigan because of improved reliability of the Total Maximum Daily Load and the resulting point-source controls; (b) reduced ground-water contaminant loading to Lake Michigan because remedial actions are supported by the model; (c) prevention of nonpoint-source pollution loading to Lake Michigan because best management practices are targeted with the model; (d) improved management of wetlands and riparian habitat based on the hydrologic model; and (e) brownfields redevelopment using information from the model.

(Note: Analysis of water samples by the USGS National Water Quality Laboratory is included in the project budget category "Other"; monitoring-well and data-recorder installation by the USGS is included in the project budget category "Construction".)

Project Milestones:	Dates:
Project Start, install network,	10/2000
Data compilation, model setup	02/2001
Data collection, calibrate model	09/2001
Discharge and loading estimates	10/2001
Model documentation, interim summary	02/2002
Coordination meetings	03/2002
Begin report	04/2002
Project End, Final report	10/2002

Project Addresses Environmental Justice

If So, Description of How:

Project Addresses Education/Outreach

If So, Description of How:

Published report will be distributed to public libraries, to Federal, State, and local-regional officials, and available on the Internet. Interim project summaries will be available on the Internet. Upon request by other Federal, State, and local agencies, project personnel will provide technical information at public meetings.

Project Budget:

	Federal Share Requested (\$)	Applicant's Share (\$)
Personnel:	144,600	0
Fringe:	0	0
Travel:	5,000	0
Equipment:	0	0
Supplies:	8,000	0
Contracts:	2,000	0
Construction:	15,000	0
Other:	45,400	0
Total Direct Costs:	220,000	0
Indirect Costs:	0	0
Total:	220,000	0
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

Existing streamflow gages in the Little Calumet River Basin, that will be used for model input, calibration, and evaluation, are operated by the USGS in cooperation with the Indiana Department of Environmental Management, the Corps of Engineers, the Calumet River Basin Commission, and the Indiana Department of Natural Resources on a cost sharing basis. Funding for the gages is contributed by the USGS and these agencies. A portion of the annual funding may be applicable to use of the gages for the proposed hydrologic model.

Description of Collaboration/Community Based Support:

Project will be coordinated with the Indiana Department of Environmental Management, the Corps of Engineers, and the Calumet River Basin Commission to provide information, receive public input, and derive community-based support for the project.